A Domain-Specific Approach to the Development of Ontology-Based Document Assessment Assistants

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Context

- **Specific – Level 1:** English professors/teachers evaluating hundreds of digital documents
- **Specific – Level 2:** Document evaluators evaluate digital documents
- **General:** “End-User Development”, “Natural Programming” → empowering users to solve problems without the assistance of software developers

- Grading codes mined over the years

- Repeat until done:
  - Identify writing pattern/anti-pattern
  - Annotate paper (by hand/using MS Word's comment feature)

- Students need to go back to the “Grading codes” to understand what the evaluator meant.
Document Evaluation: Software Assistant (1)

- Domain-Specific Language:
  - Grading codes $\rightarrow$ Ontology $\rightarrow$ Taxonomy
  - Documents $\rightarrow$ MS Word Documents
  - Ontology Manipulation $\rightarrow$
    - CRUD + Export (design and publish modes and direct manipulation)
  - Documents $\rightarrow$ as usual

- This is fundamentally a language of gestures.

- Syntax was not defined!
Document Evaluation:
Software Assistant (2)

- Meta-Models (MM):
  - Ontology MM:
    - Ontologies represented as taxonomies → general trees. Inner nodes model the “category-subcategory” relation. Leaves are attributes of category-subcategory paths.
  - Document MM:
    - Word Object Model!
Document Evaluation: Software Assistant (3)

- Semantics of Meta-Models (Meta-MM):
  - Ontologies: operational semantics through ontology manager implemented in C#.
  - Documents: operational semantics through Primary Interop Assemblies (PIA) for the Word Object Model.
Quick Demo

- Hold on ...
Future Work

- Generality of approach across disciplines (type of documents): legal, medical, software engineering, etc.
  - Ontologies are created by experts. The software assistant assists, does not usurp!
  - Humans are empowered by tools
- Communities of learners and educators ➔ collaborative building of ontologies
- “Ontology Learning” ➔ AI dreaming all over again!
Questions?

- Thank you!